

## **Chapter 2 – Alternatives Including the Proposed Action**

### **2.0 INTRODUCTION**

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### **2.0. INTRODUCTION**

This chapter outlines the public scoping process that led to the identification of significant issues and development of alternatives to the proposed action. The significant issues are described in this chapter, while information on other concerns raised during scoping can be found in the project file, located in the Nez Perce Forest Headquarters.

Several alternatives were developed in response to the significant issues and are analyzed in detail. Alternatives considered, but eliminated from detailed study, are summarized in this chapter. The chapter concludes with a tabular comparison of the alternatives analyzed in detail. The comparison is based on indicators selected by the project interdisciplinary team (IDT) to evaluate how each alternative responds to the significant issues and to the purpose and need for action.

Based on public in response to the Draft Environmental Impact Statement (DEIS), clarification of the economic and social well-being portion of the Purpose and Need Statement is provided. Evaluation of alternatives considered a combination of factors that help define economic and social well-being including:

- Protection of property and infrastructure from potential wildfire effects.
- Economic opportunities.
- Public use and enjoyment of the area.
  - Recreation opportunities.
  - Fish and wildlife habitat.
  - Water Quality.

In September 2003, a scoping letter providing information and seeking public comment was mailed to approximately 30 individuals and groups that had previously shown interest in Forest Service projects on the Nez Perce National Forest. This included Federal and State agencies, Idaho Native groups, municipal offices, businesses, interest groups, and individuals. The Forest Service received 20 responses to this mailing.

## CHANGES TO THE PROPOSED ACTION SINCE SCOPING

The proposed action for the American and Crooked River project was scoped in September 2003. Because of public comment and further field review, the proposed activities have been refined. The result is a change of 452 acres in the total fuel reduction activity acres. In the scoping letter, the Forest proposed to treat 3,000 acres of vegetation and that has been refined to 3,452 acres of vegetation treatments.

In addition, further field review found a total of 18.9 miles of roads to be decommissioned as opposed to the 30 miles identified during scoping. These roads do not improve access to the area for recreation or administrative use. Some of these roads are either currently contributing sediment to streams and they will be restored or they are not contributing sediment to the streams, in which case they will be abandoned (Appendix F).

## **CHANGES BETWEEN THE DRAFT AND FINAL EIS**

Alternative D of the Final Environmental Impact Statement (FEIS) includes all of the hazardous fuel/vegetative treatment units in Alternative D of the DEIS with the following exceptions.

- Units 99, 99.2, 105, and 329 (about 62 acres) were identified as meeting Forest Plan criteria for old growth. These units were dropped from consideration for harvest in the FEIS.
- Units 541, 542, and 543 (about 105 acres of thinning and partial canopy removal) were added between road 1810 and the top of Flatiron Ridge in order to facilitate improved wildfire containment and suppression effectiveness in this strategically important area (FEIS Section 3.4).

There were several minor changes to the Design and Mitigation Measures (FEIS Table 2.3) to add clarity or avoid duplication. Design and Mitigation Measures list applies to all alternatives analyzed in detail in and FEIS.

The reference to creating “fuel breaks” and “safety areas” from the objectives of the project has been removed because, although the project creates diverse vegetative patterns through harvest that reduces the continuity of hazardous fuels in strategic areas, it does not propose to manage these areas as long-term fuel breaks. Harvest activities will temporarily provide areas that provide increased safety for fire fighters conducting suppression activities. However, safety zones specifically delineated for public use would more appropriately be addressed through localized defensible space projects or in the Idaho County Hazard Mitigation planning process.

Based on public input, the amount of watershed restoration in the FEIS has been substantially increased over and above that which was analyzed and determined in the DEIS as sufficient to achieve an upward trend in water quality and fish habitat. The additional list of watershed improvements is shown in Table R-2 of the Record of Decision and would have a maximum equivalent to Alternative E in the FEIS.

An error in the miles of instream improvement was displayed in the DEIS. Part of the reason for this error was that some stream reaches were considered for instream improvement at two levels of intensity, with a higher level of improvement in the “additional restoration” category. The number of miles was double counted for those reaches that included both levels of treatment. These numbers have been corrected in the FEIS for all action alternatives. The actual watershed restoration that was originally proposed in the DEIS has not changed, only the way the number of miles was tabulated.

The Recreation Opportunity Spectrum percentages in Chapter 3, Section 3.6 – Recreation, that were listed in the DEIS were for the entire watershed, not for the project area. These acreages have been corrected in this FEIS.

These changes are analyzed in detail in this FEIS.

## **2.1. ISSUE DEVELOPMENT**

The intent of the scoping process is to notify affected Federal, State, and local agencies, affected Indian tribes, and interested persons of the proposed action, to solicit input regarding the proposed action, to identify the scope of the issues to be addressed in an environmental impact statement (EIS) and to determine the relevant issues related to the proposed action (CFR/CEQ 1501.7).

Preliminary issues were identified through consultation with Forest Service resource specialists and from issues identified from similar, past projects. A comprehensive list was developed after the IDT and Responsible Official reviewed the comments received during scoping.

Comments were categorized as follows:

- Covered in the effects analysis
- Addressed through project mitigation or design
- Beyond the scope of the proposed action
- Already decided by law, regulation, Forest Plan, or higher level decision
- Considered irrelevant to the decision being made
- Considered a general comment, opinion or position
- Significant issues driving an alternative

See project file for the list of comments and issue disposition.

Significant issues that could be resolved using mitigation measures, or addressed through the effects analysis are discussed in this document. Other significant issues drove alternative development. These issues are described below.

The CEQ regulations require federal agencies (in implementing NEPA) to focus on the significant environmental issues related to the proposed action. The regulations also require the identification of significant environmental issues deserving study. There are four categories of significant issues that drove alternative development; soils, water quality, fish habitat, and fuel reduction effectiveness, which follow:

### **FUEL REDUCTION EFFECTIVENESS**

The effectiveness of the proposed activities for reducing fuels across the landscape has been questioned. Many commenters stated that the most effective methods involve clearing trees and brush away from structures. This has been proven to be an effective method of protecting inholdings and structures, and this is already being done in the area. However, the intent of this project is to reduce the effects of wildfire across the landscape. Many feel that there is no effective method to reduce the effects of wildfire on the landscape other than to reduce road density (if a fire goes through an area, removing the ground cover, the roads would intercept, transport and add to the sediment reaching the streams). Some believe that thinning in lodgepole pine would tend to allow for greater fire spread and severity and that dead trees may present less of a fire hazard than green live trees.

There are concerns that the proposed fuel hazard reduction activities would not reduce the effects of large-scale fire.

## **INDICATORS OF FUEL REDUCTION EFFECTIVENESS**

- Area and distribution of fire regime
- Acres of fuel hazard reduction
- Risk/Hazard Indicator

## **WATER QUALITY**

Vegetation treatments, temporary road construction, road reconstruction, road decommissioning, and in-channel improvements may affect water quality in the short and/or long term. Cumulative effects need to be considered in the American and Crooked River watersheds.

## **WATERSHED CONDITION**

Watershed condition indicators are a series of metrics that can be used to index the level of disturbance in a watershed. They are usually expressed as densities or discrete amounts of various disturbances within a watershed. For example, road density expressed in miles of road per square mile of watershed area (mi/mi<sup>2</sup>) is a common watershed condition indicator. Roads affect watershed function in a variety of ways, related to both water yield and sediment yield.

### **INDICATOR OF WATERSHED CONDITION**

- Road Density

## **WATER YIELD**

A number of physical factors determine the relationship between canopy conditions and water yield. These include interception, evapotranspiration, shading effects and wind flux. These factors affect the accumulation and melt rates of snow and how rainfall is processed in the watershed. Live vegetation affects water yield in several ways. Leaves and needles intercept moisture from the air; roots of live trees and other vegetation take up ground water; and ground cover aids infiltration of water, decreasing runoff. Dead trees and vegetation, along with removal of vegetation can alter water yield.

Additional factors affecting water yield include compacted surfaces due to roads, skid trails, and landings. They contribute to flashy flows, due to their impervious surfaces, interception of groundwater and extension of the channel system in the form of ditches. As impervious surfaces increase, increased peak flows generally result. Peak flows can result in mobilization of both large and small materials, causing increased erosion in steep stream reaches and deposition in downstream areas.

### **INDICATOR OF WATER YIELD**

- Equivalent Clearcut Area

## **SEDIMENT YIELD**

The American and Crooked River watersheds have been affected by past activities such as timber harvest, road building, grazing, and mining. This has resulted in high road densities in most subwatersheds. These activities have affected water quality through increased sediment delivery to streams.

The proposed harvest and watershed improvement activities could affect sediment yield over time. Harvest and roadwork have the potential to increase sediment production and delivery

into streams. Some watershed improvement projects have the potential to produce sediment in the short-term, but are designed to result in long-term reductions in sediment yield.

#### **INDICATOR OF SEDIMENT YIELD**

- Sediment yield percent over base as modeled by NEZSED

#### **CHANNEL MORPHOLOGY**

Water and sediment yield can interact to change channel morphology conditions through erosion of stream channels or deposition of sediment. Channel morphology can also be affected directly through activities such as road encroachment, stream crossings, and in-channel improvements. Sediment delivery and routing processes vary by upland settings, stream types and disturbance level and type.

#### **INDICATORS OF CHANNEL MORPHOLOGY**

- Channel geometry
- Substrate composition

#### **WATER QUALITY**

Water quality includes physical and chemical characteristics of water. Parameters commonly measured include pH, alkalinity, hardness, specific conductance, nutrients, metals, sediment, and water temperature. Many of these parameters are affected to only a slight degree by forest practices. Water temperature controls the rate of biologic process, is of critical concern for fish populations, and is a primary indicator of habitat conditions.

Water temperatures in the American and Crooked River watersheds currently exceed Idaho Water Quality Standards at certain times of the year. In part, this is due to natural conditions, but has also been affected by reductions of streamside shade and changes in channel morphology.

#### **INDICATORS OF WATER QUALITY**

- Water Temperature
- Canopy density in forested reaches
- Percent shade in non-forested reaches

#### **FISH HABITAT**

Vegetation treatments, temporary road construction, road reconstruction, road decommissioning, and in-channel improvements may affect fish habitat short-term, especially considering cumulative effects in the American and Crooked River watersheds.

Vegetation treatments in Riparian Habitat Conservation Areas (RHCAs) could affect fish habitat short-term.

#### **DEPOSITED SEDIMENT**

Historically, increased sediment yield to the American and Crooked River watersheds has resulted in high levels of deposited sediment in many streams, including mainstem American and Crooked Rivers. The American and Crooked River watershed has been identified as a priority watershed for anadromous fish. Existing roads produce continued sediment yields above the base (natural) rate, reducing the ability of the watershed to recover to

predevelopment conditions on its own. High levels of deposited sediment reduce the biological carrying capacity for fish and other aquatic organisms and quality of spawning habitat.

Short-term increases in sediment yield from proposed activities might contribute to degraded substrate conditions and further reduce carrying capacity and quality of spawning habitat. Long-term reduction in sediment yield could result in long-term improvement of substrate conditions.

#### **INDICATORS OF DEPOSITED SEDIMENT**

- Cobble embeddedness
- Quality of summer and winter habitat carrying capacity as modeled by FISHSED

#### **LARGE WOODY DEBRIS**

Large woody debris in project area streams has been reduced by historical in-channel mining activities, timber harvest in streamside zones, fire suppression, and construction of roads in streamside zones. Many stream reaches in the project area have been identified as debris-deficient. Large woody debris contributes to stream productivity, creates pools, provides hiding cover for fish, and increases habitat complexity.

#### **INDICATORS OF LARGE WOODY DEBRIS**

- Estimated number of pieces of large wood in the channel following project activities
- Qualitative assessment of debris recruitment, cycling, and how the project could affect future riparian health concerning this element.

#### **POOLS HABITAT**

With reduction in large woody debris, accelerated sediment yield, and impacts to stream channels from instream mining activities, road encroachment and timber harvest, there are fewer high quality pools in the American and Crooked River watersheds than would be expected under a more natural scenario.

Some proposed activities may result in a short-term reduction in pool quality from increased sediment yield. Other proposed activities may result in direct improvement in the number of pools. Long-term sediment reduction may result in long-term improvement in pool quality.

#### **INDICATORS OF POOLS QUALITY**

- Sediment yield (peak percent over natural or base rate), as it would affect sediment deposition
- Pool: riffle ratios as a measure of existing condition
- Number of pools

#### **WATER YIELD**

Water yield specific to fish habitat is measured by Equivalent Clearcut Acres (ECA), the indicator here of water yield. With increased timber harvest and road construction comes increased water yield. Increased water yield can cause stream channel instability.

#### **INDICATOR OF WATER YIELD**

- ECA threshold

## **WATER QUALITY**

Water quality from a fish habitat standpoint is measured by the amount of toxicants in the water. Toxicants can be introduced as a result of fuel transport, storage, spillage, or use of herbicides near water bodies, wetlands, and riparian zones.

### **INDICATOR OF TOXICS**

- Mitigated to discountable by Best Management Practices (BMP) and State Requirements

## **WATER TEMPERATURE**

Water temperatures in the American and Crooked River watersheds currently exceed Idaho Water Quality Standards at certain times of the year. This is due in part to natural conditions, but also has been affected by reductions of streamside shade and changes in channel morphology.

### **INDICATOR OF WATER TEMPERATURE**

- Riparian timber harvest and riparian planting (shade).

## **HABITAT CONNECTIVITY/FISH PASSAGE**

Existing conditions limit fish passage/connectivity by isolating fish populations and restricting movement with undersized culverts.

### **INDICATOR OF HABITAT CONNECTIVITY/FISH PASSAGE**

- Culverts improved and additional miles of stream accessible.

## **2.2. DESCRIPTION OF ALTERNATIVES**

Section 102(2) of the National Environmental Policy Act (NEPA) states that all Federal agencies shall "...study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources". These unresolved conflicts, identified by the Forest Service and the public, are the NEPA issues related to the Proposed Action.

In addition to responding to unresolved conflicts, an environmental impact statement (EIS) must "...rigorously explore and objectively evaluate all reasonable alternatives" [40 CFR 1502.14(a)]. The courts have established that this direction does not mean that every conceivable alternative must be considered, but that selection and discussion of alternatives must permit a reasoned choice and foster informed decision making and informed public participation. Together, these requirements determine the NEPA range of alternatives.

The alternatives considered in detail were developed in response to the significant issues, discussed previously and are discussed below. Those that were considered but eliminated from detailed study are also discussed below.

### **ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY**

As the team worked with the scoping and project information that was available to fine tune the response to the issues, and worked through the matrix of possible vegetative treatments, the following alternatives were considered, but dismissed from detailed study.



### **“RESTORATION ONLY” AND/OR “NO TIMBER HARVEST”**

Several respondents requested this alternative. This alternative would have considered implementing watershed improvements, such as road decommissioning, improving stream crossings, etc. No fuel reduction activities would be considered.

This alternative does not respond to the purpose and need of treating existing and potential fuel loads to reduce the effects of potential large-scale wildfire and improving the safety and effectiveness of firefighters in fire suppression activities.

### **DEFENSIBLE SPACE**

Many commenters responded that reducing trees and brush within 200 feet of structures is a more effective method of reducing fire effects.

A defensible space alternative was not evaluated under this analysis because this type of action is currently being implemented in the American Crooked River Watersheds under the Crooked River Demonstration Project Decision Memo, and the proposed Orogrande Defensible Space project (on file at the Elk City Ranger Station, Red River Ranger District).

### **EXPANDED ACTION VIA ACCESS THROUGH THE ROADLESS AREA**

Some commenters requested we consider alternatives that either constructed roads into the roadless area to access the Kirks Fork and Box Sing Creeks, or requested fuels reduction in the roadless areas. In order to avoid impacts to the Inventoried Roadless Area this alternative was dropped from detailed analysis

### **EXPANDED ACTION WITH ACCESS OUTSIDE OF ROADLESS AREA**

It was suggested that treatments be concentrated in the wildland urban interface areas or the WUI areas near the Elk City Township. To access WUI areas near the township at the Kirks Fork and Box Sing Creek areas, an alternate route was suggested that did not enter the roadless area. This alternate routes would likely require crossing the public land managed by the Bureau of Land Management (BLM). The BLM has proposed the Eastside Township Project, and it was determined that it would be more appropriate to analyze the potential access and associated fuels treatment proposal in connection with the Eastside Township Project.

### **ALTERNATIVES CONSIDERED IN DETAIL**

Five alternatives, including the No Action alternative, were considered in detail. A brief summary is outlined below in Table 2-1: Alternatives Overview American River Watershed, and Table 2-2: Alternatives Overview Crooked River Watershed. Superscript notes explain the activity at the end of Table 2-2.

### **ALTERNATIVES B, C, D, AND E - ACTION ALTERNATIVES**

Alternative C was the proposed action and Alternatives B, D, and E respond to the significant issues and are alternatives to the proposed action. Alternative D is the preferred alternative and is discussed below in the section “Alternative D preferred alternative.”

None of the action alternatives would treat fuels, harvest timber, or construct roads in old growth areas or inventoried roadless areas.

- There would be no new permanent roads constructed.



- Management activities in riparian areas would be minimized.
- Activities in high hazard landslide prone areas would be avoided.
- All action alternatives would address State of Idaho TMDL limiting factors and implement watershed restoration activities designed to meet the Forest Plan requirements to establish an upward trend in water quality and fish habitat conditions that are below current objectives.
- Each action alternative implements the restoration activities to meet Forest Plan requirements.
- Alternatives address the effectiveness of fuel reduction activities by providing a range of acres treated.
- Action alternatives would maintain shade and large woody debris with PACFISH regulated buffers.

Table 2.1: Alternatives in the American River Watershed, and Table 2.2: Alternatives in the Crooked River Watershed displays the activities for all the action alternatives. See maps 2a, 2b, 3a, 3b, 4a, 4b, 5a, 5b of the alternatives for the proposed fuel reduction areas and Map 11 for the proposed watershed improvement activities.

**Table 2.1: Alternatives in the American River Watershed.**

Proposed Activity - American River		Alt B	Alt C	Alt D <sup>1</sup>	Alt E
Acres of Treatment	Tractor Yard/Machine Pile	409	482	841	283
	Cable Yard/Broadcast Burn	175	239	239	79
	Roadside Salvage	135	151	137	138
	<b>Total Acres Treated</b>	<b>719</b>	<b>872</b>	<b>1217</b>	<b>500</b>
	Percent Clearcut	41%	41%	29%	15%
	Percent Partial Cut/Thin	59%	59%	71%	85%
	Wildland Urban Interface	295	417	464	85
Miles of Temporary Road Construction <sup>2</sup>		3.6	8.1	8.1	1.9
Miles of Road Reconditioning <sup>3</sup>		30.2	30.8	33.9	25.8
<b>Watershed Restoration Package Improvements</b>					
Miles (acres) of decommissioned roads <sup>4</sup>		4.9 (20)	7.5 (30)	8.4/11 (34/44)	19.5 (78)
Miles of Watershed Road Improvement <sup>5</sup>		6.6	6.6	7.4	7.4
Number of sites of Watershed Road Improvement		0	0	0	0
Stream crossing improvements <sup>6</sup>		3.	3	3/6	9
Miles of instream improvements		0	0	0	0
Miles of Recreation and Trail improvements		1.6	1.6	1.6/0.8	2.4
Acres of Recreation & Trail improvements		0	0	0	0
Acres of Mine Site Reclamation		0	0	0	0
Acres of Soil Restoration		5	8	9/12	21
Access change for vehicle use - motorized trail use (ATV) to restricted use (snowmobiles over snow) <sup>7</sup>		1.6	1.6	1.6	1.6
Miles of Access change for vehicle use <sup>8</sup>		0	0	0	0

<sup>1</sup> Alternative D includes required and additional restoration. The first number is required restoration, the second is additional restoration contingent on available funding. A "/" is displayed between the numbers.

<sup>2</sup> Temporary roads would be decommissioned within one to three years of construction.

<sup>3</sup> This category includes a range of activities, such as surface blading, drainage repair, and roadway brushing with occasional culvert installations, slump repairs, and stabilization work. The roadwork in this category is primarily for the purpose of timber removal..

<sup>4</sup> Road decommissioning for this project covers a range of activities, from recontouring to abandonment due to grown in conditions. See Appendix F

<sup>5</sup> Some of the roadwork in this category is also included in the Miles of Road Reconditioning category in this table. Although this roadwork is primarily for the purpose of timber removal, it will also result in an improvement in watershed health.

<sup>6</sup> Stream crossing improvements include upgrading or improving culverts and bridges to improve fish passage and peak water flows and are listed as the number of sites.

<sup>7</sup> This is an access change, which restricts use to two wheeled vehicles or snowmobiles over snow, from previous all terrain vehicle use (ATV).

<sup>8</sup> This is a roads-to-trails conversion.

**Table 2.2: Alternatives in the Crooked River Watershed.**

Proposed Activity – Crooked River		Alt B	Alt C	Alt D <sup>1</sup>	Alt E
Acres of Treatment	Tractor Yard/Machine Pile	729	690	975	618
	Cable Yard/Broadcast Burn	770	856	931	701
	Roadside Salvage	332	326	329	337
	<b>Total Acres Treated</b>	<b>1,831</b>	<b>1,872</b>	<b>2,235</b>	<b>1,656</b>
	Percent Clearcut	43%	43%	36%	32%
	Percent Partial Cut/Thin	57%	57%	64%	68%
	Wildland Urban Interface	264	314	649	205
Miles of Temporary Road Construction <sup>2</sup>		4.4	6.2	6.2	3.5
Miles of Road Reconditioning <sup>3</sup>		49.2	49.5	56.6	48.5
<b>Watershed Restoration Package Improvements</b>					
Miles (acres) of Decommissioned Roads <sup>4</sup>		9.0 (36)	9.8 (39)	10.5/7.0 (39/30)	17.5 (69)
Miles of Watershed Road Improvement <sup>5</sup>		8.6	9.2	9.2/8	17.2
Number of Sites of Watershed Road Improvement		1	3	3	3
Stream Crossing Improvements <sup>6</sup>		7	7	10/16	25
Miles of Instream Improvements		10.3	11.1	11.1/3.5	14.6
Miles of Recreation and Trail improvements		0.7	0.7	0.7/1.5	2.2
Acres of Recreation and Trail improvements		0	4	8	8
Acres of Mine Site Reclamation		7	7	7/2	9
Acres of Soil Restoration		13	18	23/14	37
Access change for vehicle use - motorized trail use (ATV) to restricted use (snowmobiles over snow) <sup>7</sup>		1.0	1.0	1.0	1.0
Miles of Access change for vehicle use <sup>8</sup>		1.6	1.6	1.6	1.6

<sup>1</sup> Alternative D includes required and additional restoration. The first number is required restoration, the second is for additional restoration contingent on available funding. A “/” is displayed between the numbers.

<sup>2</sup> Temporary roads would be decommissioned within one to three years of construction.

<sup>3</sup> This category includes a range of activities, such as surface blading, drainage repair, and roadway brushing with occasional culvert installations, slump repairs, and stabilization work. The roadwork in this category is primarily for the purpose of timber removal.

<sup>4</sup> Road decommissioning for this project covers a range of activities, from recontouring to abandonment due to grown in conditions. See Appendix D

<sup>5</sup> Some of the roadwork in this category is also included in the Miles of Road Reconditioning category in this table. Although this roadwork is primarily for the purpose of timber removal, it will also result in an improvement in watershed health. This is an access change of miles of roads to trails use.

<sup>6</sup> Stream crossing improvements include upgrading or improving culverts and bridges to improve fish passage and peak water flows and are listed as the number of sites.

<sup>7</sup> This is an access change, which restricts use to two wheeled vehicles or snowmobiles over snow, from previous all terrain vehicle use (ATV).

<sup>8</sup> This category includes 1.5 miles of road-to-trail conversion.

Appendix H contains a detailed description of all the treatment types by unit by alternative. This is summarized for the entire project in Table 2.4: Alternatives in the American and Crooked River Project. The vegetation section in Chapter 3 contains an explanation of the existing conditions and environmental consequences of these alternatives. General information on the developed alternatives is below.

### **ALTERNATIVE A – NO ACTION**

Both Forest Service and the CEQ regulations require the development of the No Action alternative. This alternative serves as the baseline for comparison of the effects of all action alternatives.

Under this alternative, there would be no change in current management direction or in the level of ongoing management activities within the project area. No fuel reduction or watershed improvement activities would be implemented. Work previously planned within and/or adjacent to the project area would still occur under this alternative (Chapter 3; Table 3.1, Projects considered for cumulative effects).

### **ALTERNATIVE B**

This alternative was developed in response to concerns that the proposed action was treating too many acres. This alternative treats 2,550 acres. It contains the watershed improvement activities described in Appendix D and summarized above that would provide for an upward trend in fish habitat and water quality.

### **ALTERNATIVE C – PROPOSED ACTION**

The proposed action was developed to respond to the purpose and need and was scoped in June 2003. This alternative would reduce existing and potential fuel loads through removing dead and dying lodgepole pine and live ladder fuels. It would treat 2,744 acres. It would also implement watershed improvement activities that would provide for an upward trend in fish habitat and water quality.

### **ALTERNATIVE D – PREFERRED ALTERNATIVE**

The preferred alternative was developed in response to significant issues raised by the public. This alternative looks at more possibilities along roads than the proposed action. It would treat 3,452 acres. Entry into mixed conifer stands is included to meet the economic objective. It would also require concurrent watershed improvement activities that would provide for an upward trend in fish habitat and water quality, additional restoration activities, above the required concurrent have been analyzed in this document so that they can be implemented as funding allows.

### **ALTERNATIVE E**

This alternative proposes activities that would reduce impacts to soils and aquatics in the American and Crooked River watersheds. It reduces ground-disturbing activities and includes the most comprehensive watershed improvement package. This alternative addresses the soils and aquatics issues beyond what would be required to attain an upward trend. It contains the maximum aquatics improvements package. It would treat 2,156 acres. The economic impact of this alternative is discussed in Chapter 3, Section 3.12.

## **2.3. COMPARISON OF ALTERNATIVES, OBJECTIVES SUMMARY, MITIGATION, AND MONITORING**

### **COMPARISON OF ALTERNATIVES**

A side-by-side comparison of alternatives is displayed in Table 2.1: Alternatives in the American River Watershed and Table 2.2: Alternative in the Crooked River Watershed summarize and compare the alternatives based on the indicators identified for each significant issue. More detailed discussions follow on a resource basis in Chapter 3.

### **OBJECTIVES**

Promote the health and vigor of timber stands and improve the environment for long-lived, fire resistant species by reducing densities of lodgepole pine or other small diameter trees that provide fuel ladders for development of crown fires,

Increase relative proportions of long-lived, fire resistant tree species by restoring or regenerating to western larch, ponderosa pine, and by protecting large diameter ponderosa pine, Douglas fir, and western larch,

Reduce the risk of large-scale crown fire spread by creating vegetative patterns through harvest or silvicultural treatments, that would increase fire suppression and management effectiveness, and

Reduce the likelihood of severe local fire effects by removing dead, dying, and downed trees that would otherwise result in high fuel loading.

### **MITIGATION AND MONITORING**

The rest of this chapter discusses the design and mitigation measures. The monitoring plan that would apply to all action alternatives can be found in Appendix I.

The action alternatives are designed to have minimal long-term detrimental impacts and substantial long-term beneficial impacts on the environment. Short-term impacts may be minimized through mitigations measures. The following table outlines the project design and mitigation measure. This list is not all-inclusive as the Forest Plan standards are incorporated by reference.

Project design measures are applied prior to and during activity implementation to reduce potential impacts to resources (Table 2.3: Design Criteria and Mitigation Measures). The following project design measures, mitigation measures, and Best Management Practices have been incorporated into the action alternatives with the intent of preventing or reducing adverse impacts to resources.

### **DESIGN CRITERIA COMMON TO ALL ACTION ALTERNATIVES**

Design criteria associated with the harvest, and road construction and reconstruction were developed to avoid or reduce potential resource impacts. Public comments were considered when developing these measures. The following measures and management requirements were designed to apply to all action alternatives. The sale preparation forester and the sale administrator would identify the specific conditions of the timber sale (Timber Sale Contract, Division A). Standard provisions (Timber Sale Contract, Division B) and any specific provisions (Timber Sale Contract, Division C) would also be applied.

Best Management Practices (BMPs) were used to plan this project. BMPs are the primary mechanism to enable the achievement of water quality standards to ensure compliance with the Clean Water Act of 1972, as amended (1977 and 1987) and Idaho State Water Quality Standards. BMPs are applied as a system of practices that are basically a preventative rather than an enforcement system. BMPs are a management and planning system in relation to sound water quality goals, including both broad policy and site-specific prescriptions and are designed to accommodate site-specific conditions. They are tailor-made to account for the complexity and physical and biological variability of the natural environment. As defined in the Idaho State Water Quality Standards (IDAPA 58.01.02), BMPs include the Idaho Forest Practices Act Rules (IDAPA 20.02.01) and Idaho Stream Alteration Rules (IDAPA 37.03.07). BMPs also include the USDA Forest Service Northern and Intermountain Region's Soil and Water Conservation Practices Handbook (FSH 2509.22). BMPs are also derived from the Nez Perce National Forest Plan as amended. BMPs specifically tailored to this project are defined below and will be included in contracts or other measures used to implement the project.

In addition, watershed and/or fish habitat improvement projects to improve water quality and fisheries habitat in the long-term are required in all the subwatersheds where harvest and road construction/reconstruction activities occur at levels considered to be an entry (as defined in Gerhardt, 1991b). These projects are connected actions and mitigations for specific existing conditions and past activities that have negatively impacted aquatic resources in the affected watersheds. They are designed to mitigate effects of harvest activities such as increased sediment yield and road densities. Some of the watershed improvement projects are likely to have short-term negative impacts on aquatic resources during the implementation and post-project stabilization phases, and long-term positive impacts. The watershed improvement projects also have specific design criteria and BMPs to reduce the short-term impacts on fish habitat and water quality. The watershed and fish improvements projects, design criteria, and BMPs are addressed in *Watershed and Fish Habitat Improvement Projects*. Effectiveness of BMPs commonly used on the Nez Perce National Forest was described in Gerhardt, *et al*, 1991b.

Table 2.3 outlines the project design and mitigation measures. This list is not all-inclusive, as the Forest Plan standards (USDA FS, 1987a) are incorporated by reference.

**Table 2.3 - Project Design and Mitigation Measures.**

#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
<b>Areas Excluded from Timber Harvest or Fuel Reduction Activities</b>			
1	No timber harvest or mechanical fuel reduction activities would occur in Forest Plan existing or replacement old growth, Inventoried Roadless Areas, streamside RHCAs, or high hazard landslide prone areas	NEPA project design, silviculture prescription, and field prep.	High, based available inventory and monitoring data
<b>Vegetation</b>			
2	Falling would be done to minimize breakage and damage to residual trees.	Field preparation, contract and contract administration/ inspection	High, based on sale administrators' observations
3	Silvicultural prescriptions would be written for each unit, including slash treatment and burn guidelines to meet Riparian Management Objectives	Silvicultural prescription	High, based on protocols for silvicultural certification
<b>Riparian Habitat Conservation Areas</b>			
4	No cutting of trees would be allowed in PACFISH default streamside or wetland RHCAs, except at temporary road crossings, instream habitat improvements, and to facilitate anchoring of cable yarding systems.	Field preparation, contract and contract administration/ inspection	High, based on inventory and monitoring data
5	Post harvest burning will occur in harvest units to reduce slash and fuel resulting from the harvest activities. The burning will be designed and implemented with the intent of restricting burning to stay within the unit boundary. Fire that moves outside the external unit boundary will be suppressed if it poses a threat to riparian resources. On occasion fire will move into small RHCA inclusions within the unit. Burning will not be ignited within these areas, but may be allowed to back into these areas under conditions where fire intensity will be low and burning will not result in extensive reduction in canopy cover or exposure of bare soil in these RHCA inclusions.	FS Fuels management	High, based on Research, PNW Lab, Starkey Project
6	Landslide prone areas are also considered Riparian Habitat Conservation Areas (RHCAs). No timber harvest would occur in areas of high landslide hazard, as described in (1) above. Timber harvest, road construction, or fuel reduction in areas of moderate landslide risk would be modified as needed to protect slope stability. If additional, unmapped landslide prone areas are found during project implementation, areas would be dropped or activities would be modified with watershed specialist oversight to protect slope stability.	NEPA project design, silviculture prescription, and field prep.	High, based on landslide inventory data



#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
<b>Soils, Water Quality, and Fish Habitat</b>			
7	Planned activities would be modified in any proposed timber harvest or fuel reduction unit that is found to have previously unidentified significant soil impacts from past human-caused disturbance. The planned activities in that unit would be modified or dropped, or post-harvest restoration implemented to ensure that cumulative impacts would not exceed Forest Plan soil quality standard number 2 (percent of area detrimentally impacted upon completion of activities). Site-specific review of treatment units prior to implementation would identify extent of detrimental soil disturbance.	NEPA project design, silviculture prescription, and field prep.	Moderate, based on research and forest monitoring data (Cullen et al., 1991, Froelich et al., 1983, USDA FS 1988B, 1990, 1992, 1999, and 2003D).
8	Timber harvest and fuel reduction activities would be coordinated with soil restoration activities for greatest efficiency.	Contract administration	Expected to be moderate, little data.
9	Broadcast burning would be applied in preference to excavator piling wherever practical to reduce physical soil damage and to encourage natural regeneration.	NEPA project design, silviculture prescription, and contract.	High, to the degree implemented; based on forest monitoring data (USDA FS 1988B, 1990, 1992, 1999, and 2003D).
10	Temporary roads would be built, used, and decommissioned within a 1 to 3-year period, in order to reduce the amount of sediment production. Coordination of temporary road use and decommissioning with the BLM Eastside Township project would be required.	NEPA project design and contract administration	Moderate, based on implementation monitoring of timber sale contracts and Burroughs and King, 1989.
11	New, temporary roads would be constructed using minimal road widths and out-sloped surface drainage. Road cuts, fills, and treads would be stabilized with annual grass cover where roads are held more than one year. Temporary roads would be located to avoid live water and high-risk landslide prone terrain. If avoidance of live water is not possible, stream crossings would be designed consistent with criteria described below and in Forest Plan Amendment 20 (PACFISH)	Contract and contract administration/inspection	High, based on literature (Water/Road Interaction Technology Series, USDA Forest Service, San Dimas Technology and Development Program, 1999; Burroughs and King, 1989)
12	Coarse woody debris greater than 3 inches diameter would be retained in timber harvest or fuel reduction units in amounts to meet guidelines in Appendix K.	NEPA project design, silviculture prescription, contract, and contract administration.	High effectiveness, based on Graham et al., 1994 and Harvey et al., 1987. Implementation effectiveness has not

#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
			been monitored.
13	Minimize whole tree yarding. Whole-tree yard boles only, leaving tops <b>and limbs</b> on site, to maintain foliar nutrients. Over-winter slash at least one winter to allow nutrients to leach into the soil.	NEPA project design, silviculture prescription, BD plan, and contract.	High (Garrison and Moore, 1998; Moore et al., 2004)
14	Winter harvesting would only occur during frozen conditions. Frozen conditions are defined as greater than 4 inches of frozen ground, a barrier of snow greater than two feet in depth (unpacked snow), or one foot in depth (packed snow).	Contract administration	Moderate, based on forest monitoring data (1987 report in project file)
15	Timber harvest, fuel reduction, and soil and stream restoration activities would be limited or suspended when soils are wet, such that resource damage may occur, to reduce rutting, displacement and erosion.	Contract and contract administration/inspection	Moderate, based on forest monitoring (USDA FS 1988B, 1990, 1992, 1999, and 2003D).
16	Skid trails, landings, and yarding corridors would be located and designated to minimize the area of detrimental soil effects. Tractor skid trails would be spaced 80 to 120 feet apart, except where converging on landings, to reduce the area of detrimental soil disturbance. This does not preclude the use of feller bunchers if soil impacts can remain within standards.	Contract and contract administration/inspection	Moderate, based on forest monitoring (Froelich, <i>et al</i> , 1981; USDA FS 1988B, 1990, 1992, 1999, and 2003D).
17	On excavator piled units, additional trail construction would be minimized, machines would be restricted to existing trails as much as possible, number of passes would be minimized, and excavator piling would be minimized, to reduce soil compaction. Numerous small piles are preferred to few large piles to avoid nutrient losses and soil alteration that favor weed invasion.	Contract and contract administration/inspection	Moderate, based on forest monitoring (USDA FS 1988B, 1990, 1992, 1999, and 2003D).
18	Cable systems would use one-end or full suspension wherever possible to minimize soil disturbance.	Contract and contract administration/inspection	High where implemented (USDA FS 2003A; Krag, 1991)
19	Excavated skid trails and landings with cut slopes of more than 1 foot would be scarified and recontoured, replacing topsoil as feasible on all landings and trails not needed for harvest within the next 15 years. Winged subsoiler, excavator, or similar equipment is preferred to restore permeability and soil structure.	Contract and contract administration/inspection	High (Plotnikoff et al., 1999; Sanborn et al. 1999A, Sanborn et al., 1999B)
20	Fine organic matter and slash would be scattered over recontoured or scarified areas on skid trails, decommissioned roads, and landings with a goal of achieving 10 tons per acre of fines and 15-20 tons per acre of larger material, up to 35 tons total where available and acceptable to fuel managers. Water bars and seeding of approved weed-free annual or native species would be added as needed for supplementary erosion control.	Contract and contract administration/inspection	High (Sanborn et al., 1999A)

#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
21	Soil restoration areas would be stabilized within 14 days, using erosion barriers, slash, or mulch as needed. Any soil restoration in an activity area would be completed within one operating season, with allowance for additional planting in subsequent seasons.	Contract and contract administration/inspection	Moderate, based on past experience.
22	Non-excavated skid trails and landings not needed for harvest within the next 15 years, that have been cut, compacted or entrenched 3 inches or more would be scarified to a depth of 4 – 10 inches, or as directed by contract administrator, to restore soil permeability. Excavator, winged subsoiler or similar equipment is preferred, to avoid mixing surface ash layer and subsoil.	Contract and contract administration/inspection	Moderate to high (Froelich et al., 1983; Froelich et al, 1985; Foltz and Mallard, 2004; Luce, 1997)
23	Sediment and erosion control measures such as dewatering culverts, sediment barriers, rocking road surfaces and/or ditches, etc., would be used as needed when constructing, reconstructing, and decommissioning roads to protect fish habitat and water quality.	Contract and contract administration	High, based on literature, San Dimas, Road/Water Interaction
24	Activities including stream crossing road improvements would be conducted in fish bearing streams between July 1 and August 15 to avoid sediment deposition on emerging steelhead or Chinook redds, or disturbance to bull trout moving to natal streams. These dates may be site-specifically adjusted through coordination with the Central Idaho Level I team and other agencies.	NEPA project design, contract and contract administration/inspection	Moderate to high, based on past experience.
25	Stream crossing structures would provide for channel width, flow velocities, substrate condition, and stream gradients that approximate the natural channel and accommodate passage of streamflow, debris, fish, and other aquatic organisms, and would use PACFISH standards. When designing new structures, consider and give preference to open-bottom arches, bridges and oversized culverts.	NEPA project design, contract and contract administration/inspection	High, based on literature, San Dimas, Road/Water Interaction
26	During instream habitat improvement activities, tree felling in RHCAs would occur only where that activity would not affect Riparian Management Objectives for shade and woody debris recruitment. Wood for instream placement would be taken from outside the RHCA wherever feasible.	Contract and contract administration/inspection	High, based on past experience.
27	Prior to instream habitat improvement activities, heavy equipment would be inspected to assure no leakage of oil, fuel, or hydraulic fluid.	Contract and contract administration/inspection	Moderate to high, based on past experience.
28	A Spill Prevention Control and Countermeasures Plan (40 CFR 112) would be prepared and implemented that incorporates the rules and requirements of the Idaho Forest Practices Act Section 60, Use of Chemicals and Petroleum Products; and US Department of Transportation rules for fuels haul and temporary storage; and additional direction as applicable.	Contract and contract administration/inspection	High, based on past experience.
29	For instream activities in fish-bearing streams that contain listed species, fish are expected to disperse from the activity area. If needed, additional measures would be used to ensure fish are not harmed or killed by instream activity. If	Contract and contract administration/inspection	Moderate, based on past experience.

#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
	electrofishing were necessary, it would be conducted in accordance with NOAA Fisheries electrofishing guidelines found at <a href="http://www.nwr.noaa.gov">http://www.nwr.noaa.gov</a> .		
30	The State of Idaho Best Management Practices (BMPs) and Forest Service Soil and Water Conservation Practices (SWCPs) would be applied. These are incorporated by reference.	Contract and contract administration/inspection	High, based on past experience.
<b>Trails/Recreation</b>			
31	Coordination would minimize conflict with winter hauling on roads used as groomed snowmobile routes.	Project design, contract and contract administration/inspection	Moderate, based on past experience.
32	Trails 820, 832, 838, 844, 848, and others as identified, would be protected during activities. Designate all system trails as Protected Improvements in the Timber Sale Contract. No skidding across trails, except over snow, fall trees away from trails, cut stumps less than 12" in height within 100 feet of trails, leave regeneration within 100 feet of trails to create a visual buffer between treatment areas and trails, construct firelines to protect the regeneration buffer and trail during slash treatment, and trails are not to be used a firelines.	Contract and contract administration/inspection	High, based on past experience.
<b>Access/Public Safety</b>			
33	Temporary roads would be closed to public use, except as specifically authorized.	Contract and contract administration/inspection	Moderate for sediment reduction and wildlife security, based on monitoring
34	Operator would be required to set up warning signs advising of equipment operations or hazards for public safety.	Contract and contract administration/inspection	High, based on past experience.
<b>Air Quality</b>			
35	Procedures outlined in the North Idaho Smoke Management Memorandum of Agreement would be followed, including restrictions imposed by the smoke management-monitoring unit.	FS fuels management	High, based on burning approval required daily by smoke monitoring unit.
36	Prescribed burning would be conducted over several years to reduce the amount of smoke in any one year. Priority in scheduling would be given to units accessed by temporary roads scheduled for decommissioning	FS fuels management	High, based on past experience, and availability of burn windows and/or personnel.
37	Additional restrictions, beyond those imposed by the smoke management-monitoring unit, would be considered for prescribed burning for local air quality reasons, including visual.	FS fuels management	High, based on past experience.

#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
<b>Wildlife</b>			
38	Snag and snag replacement green trees would be retained in numbers consistent with Regional Guidelines (Appendix K)	Field preparation , NEPA project design, contracting and contract administration	High except where safety concerns or wood cutting result in loss.
39	Should any of the following be sighted in the project area during project layout and implementation, the U.S. Fish and Wildlife Service and unit biologist would be notified: lynx or a lynx den, bald eagle, new wolf den or rendezvous site, active goshawk nest. Appropriate protection measures would be implemented where deemed necessary to protect these species.	NEPA project design, silvicultural prescription, field prep, contract administration/inspection, and USFWS monitoring	Moderate; based on public sightings reports and ESA section 7 consultation.
40	Should an active goshawk nest be discovered within a 450 feet distance of timber harvest or fuel reduction activities, the nest tree will be protected, as well as a 10-15 acre no-treatment buffer area around the nest tree, as designated by the unit biologist to provide for foraging and nesting sites.	Field prep, contract and contract administration/ inspection	Moderate; based on IDFG, et al, 1995, State Conservation Effort
41	The integrity of existing access management restrictions would be maintained within the planning area for wildlife security purposes. Current access management restrictions would apply to existing reconstructed roads after implementation of activities to maintain or improve existing access and wildlife security. No contractor or their representatives may use motorized vehicles to hunt or trap animals on a restricted road.	Contract and contract administration/inspection	High except close to roads; based on standard timber sale contract clauses and past results monitoring .
<b>Heritage Resources</b>			
42	Known historic properties or sites would be avoided or protected.	NEPA project design, field prep, contract, and administration/inspection	High, objective to achieve a “no adverse effect” on these resources
43	If additional cultural resources are discovered during project operations, all ground-disturbing activities in that area will be halted until such resources can be properly documented and evaluated by the Forest Archaeologist in compliance with 36 CFR 800.13b3	Contract and contract administration/ inspection	Moderate based on recognition of resource and contact with Heritage personnel
<b>Noxious Weeds</b>			
44	Desirable vegetation would be promptly established on all disturbed areas, using native and non-native plant species, as approved by the Forest botanist.	Contract and contract administration/inspection	Moderate based on experience
45	All named plant cultivars used in revegetation will be certified blue-tagged. All non-certified seed will be tested by a certified seed laboratory against the all state noxious weed list and documentation of the seed inspection test provided to the contract administrator. All straw and mulch would be certified as free of	Contract and contract administration and inspection	High, based on experience

#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
	noxious weed seed.		
46	All mud, soil and plant parts would be removed from all off-road equipment associated with the project before moving into the project area to limit the spread of weeds. Cleaning must occur off National Forest lands. This applies to all ATVs used on and off roads in the project area, but does not apply to service or hauling vehicles that would stay on the roadway, traveling frequently in and out of the project area.	Contract and contract administration and inspection	High; based on past experience
47	All private rock used for surfacing would be county-certified as free of noxious weed seed. Forest Service rock sources will be reviewed for invasive weeds by a forest weed specialist or botanist. Borrow pits and stockpiles will not be used if it is determined that it is infested with an invasive plant that is not found in the area where the material will be placed.	Contract and contract administration/ inspection	Moderate; based on past experience
48	All small outbreaks of invasive weeds within the project risk zones (Map 16b), and along all haul routes leading to weed risk zones will be pretreated prior to ground disturbing activities under the existing weed management program.	Field prep, contract	High: based on past experience
<b>TES Plants</b>			
49	Candystick, a former Region 1 sensitive plant species, occurs in some management units. Where live lodgepole are associated with candystick, groups of live lodgepole pine would be left to protect candystick from management activities.	NEPA project design, field prep, contract and contract administration/ inspection	High based on past monitoring and experience.
50	During implementation, if activities would impact previously unknown sensitive plant occurrences, appropriate protection measures would be implemented. Appropriate measures will vary depending upon the ecology of the species involved and nature of the proposed action and would be directed by a botanist.	Silvicultural prescription, field preparation, contract, and contract administration/inspection	High based on monitoring, experience, and logic.
<b>Roadside Salvage<sup>1</sup></b>			
51	Roadside salvage would be limited to dead or dying trees, with no harvest of standing trees more than 20 inches in diameter. (Windthrown trees would not be subject to the diameter limit.)	Contractor permit	High; based on based experience and accessibility to sites
52	Salvage would be limited to areas adjacent to haul roads. No tree cutting or yarding would occur in RHCAs or in allocated existing or replacement old growth.	Contractor permit	High; based on based experience and accessibility to sites
53	All yarding would be done from the road. Areas above steep cutslopes that cannot be protected from yarding damage would be omitted from salvage.	Contractor permit	High; based on based experience and

<sup>1</sup> Treatments would include roadside salvage within 100 feet of main haul roads. This component of the action would comply with all applicable design criteria developed for the action as a whole. These design criteria are not intended to limit or interfere with brushing, clearing, or hazard reduction activities associated with routine road maintenance.

#	Project Design and Mitigation Measure	Implementation Method	Effectiveness
	Yarding distance would not exceed 100 feet.		accessibility to sites
54	No more than 80 dead or dying trees per mile (approximately 8 trees/acre) could be designated for cutting on each side of the road.	Contractor permit	High; based on based experience and accessibility to sites
55	Maximum opening size is one acre on each side of a road, or a maximum of 400 feet along the road.	Contractor permit	High; based on based experience and accessibility to sites
56	Openings would be separated from other forest openings by at least 200 feet of pole size or larger forest along the road, on both sides, to provide cover for wildlife crossing.	Contractor permit	High; based on based experience and accessibility to sites
57	Slash from salvage would be lopped and scattered, hand piled and burned in the woods, or removed from the site at the discretion of the District Ranger considering the Forest objective of maintaining less than 12 tons per acre of fine fuels.	Contractor permit	High; based on based experience and accessibility to sites



**Table 2.4: Alternatives in the American and Crooked River Project.**

<b>Proposed Activity – Total Project</b>		<b>Alt B</b>	<b>Alt C</b>	<b>Alt D<sup>1</sup></b>	<b>Alt E</b>
Acres of Treatment	Tractor Yard/Machine Pile	1,138	1,172	1,813	901
	Cable Yard/Broadcast Burn	945	1,095	1,173	780
	Roadside Salvage	467	477	466	475
	<b>Total Acres Treated</b>	<b>2,550</b>	<b>2,744</b>	<b>3,452</b>	<b>2,156</b>
	Percent Clearcut	42%	42%	34%	28%
	Percent Partial Cut/Thin	58%	58%	66%	72%
	Wildland Urban Interface	559	731	1113	290
Miles of Temporary Road Construction <sup>2</sup>		8.0	14.3	14.3	5.4
Miles of Road Reconditioning <sup>3</sup>		89.6	77.8	90.5	94.5
<b>Watershed Restoration Package Improvements</b>					
Miles (acres) of decommissioned roads <sup>4</sup>		13.9 (56)	17.3 (69)	18.9/18.1 (73/74)	37.0 (147)
Miles of Watershed Road Improvement <sup>5</sup>		15.2	15.8	16.6/8	24.6
Number of sites of Watershed Road Improvement		1	3	3	3
Stream crossing improvements <sup>6</sup>		10	10	12/22	35
Miles of instream improvements		10.3	11.1	11.1/3.5	14.6
Miles of Recreation and Trail improvements		2.3	2.3	2.3/2.3	4.6
Acres of Recreation and Trail improvements		0	4	8	8
Acres of Mine Site Reclamation		7	7	7/2	9
Acres of Soil Restoration		18	26	32/26	58
Acres of Soil Restoration					
Access change for vehicle use - motorized trail use (ATV) to restricted use (miles) <sup>7</sup>		1.0	1.0	1.0	1.0
Access change for vehicle use – road to trail <sup>8</sup>		2.6	2.6	2.6	2.6
<b>Employment Opportunities</b>					
Job Years <sup>9</sup>		163	188	250	152

<sup>1</sup> Alternative D includes required and additional restoration. The first number is for required restoration, the second is additional restoration contingent on available funding. A "/" is displayed between the numbers.

<sup>2</sup> Temporary roads would be decommissioned within one to three years of construction.

<sup>3</sup> This category includes a range of activities, such as surface blading, drainage repair, and roadway brushing with occasional culvert installations, slump repairs, and stabilization work. The roadwork in this category is primarily for the purpose of timber removal.

<sup>4</sup> Road decommissioning for this project covers a range of activities, from recontouring to abandonment due to grown in conditions. See Appendix F

<sup>5</sup> Some of the roadwork in this category is also included in the Miles of Road Reconditioning category in this table. Although this roadwork is primarily for the purpose of timber removal, it will also result in an improvement in watershed health.

<sup>6</sup> Stream crossing improvements include upgrading or improving culverts and bridges to improve fish passage and peak water flows and are listed as the number of sites.

<sup>7</sup> This is an access change, which restricts use to two wheeled vehicles or snowmobiles over snow, from previous all terrain vehicle use (ATV).

<sup>8</sup> This is an access change of miles of roads to trails use.

<sup>9</sup> Direct Employment Opportunities, year-long.

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